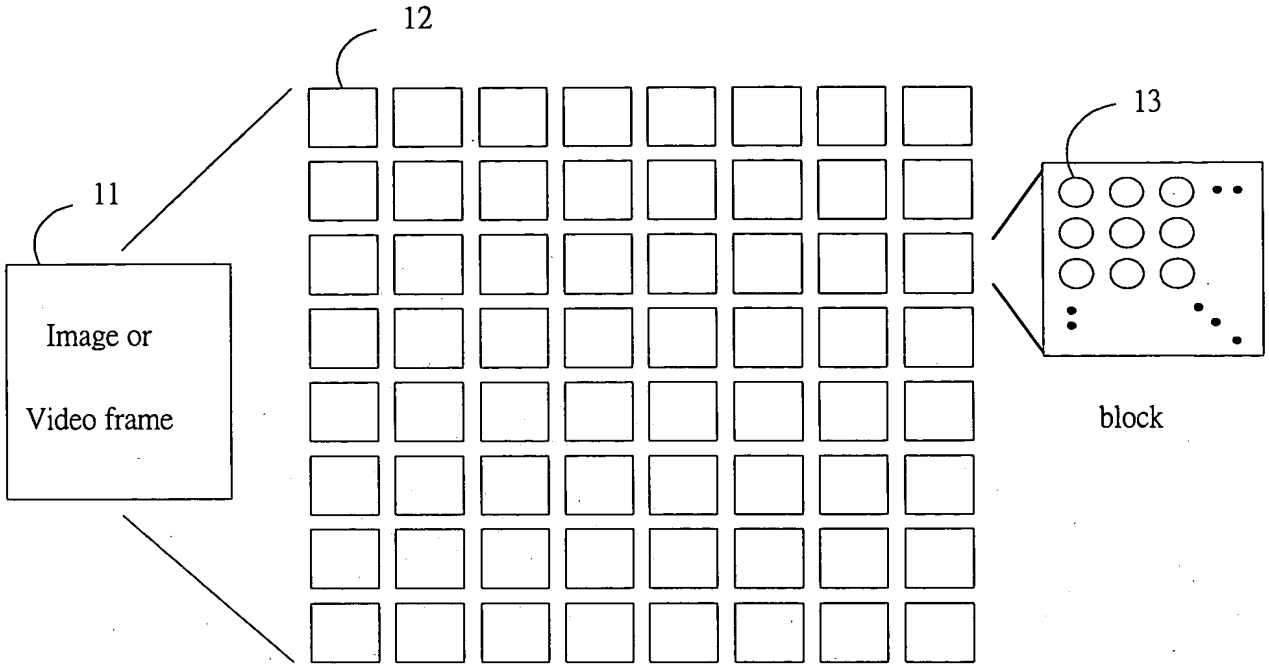

Fig. 1

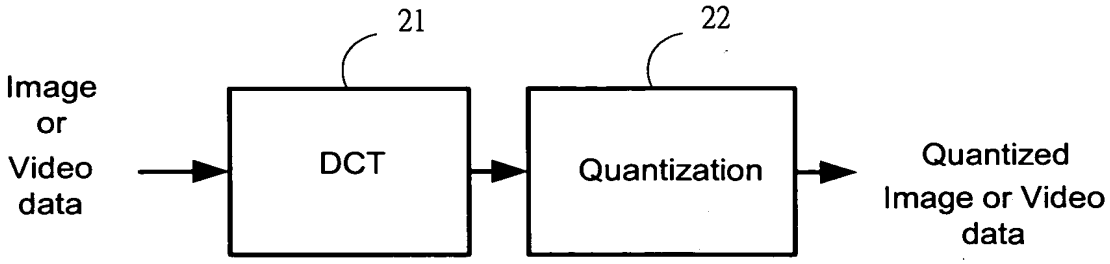
21
22
Image
or
Video
data
DCT
Quantization
Quantized
Image or Video
data

Fig. 2a

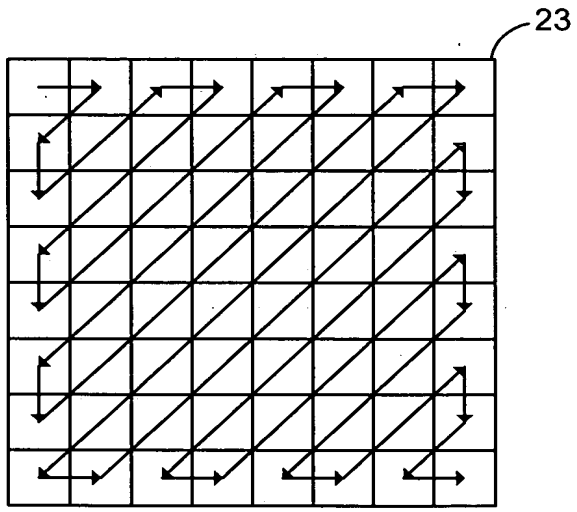
23

Fig. 2b

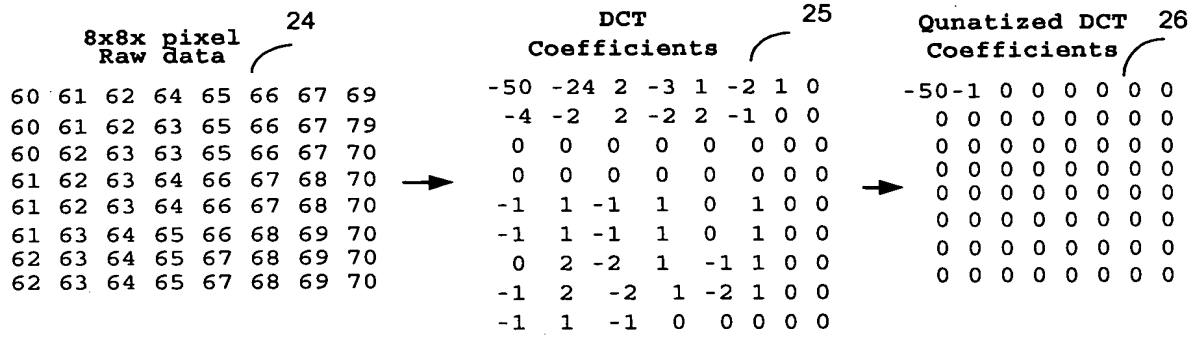
8x8x pixel
Raw data
24
60 61 62 64 65 66 67 69
60 61 62 63 65 66 67 79
60 62 63 63 65 66 67 70
61 62 63 64 66 67 68 70
61 62 63 64 66 67 68 70
61 63 64 65 66 68 69 70
62 63 64 65 67 68 69 70
62 63 64 65 67 68 69 70
DCT
Coefficients
25
-50 -24 2 -3 1 -2 1 0
-4 -2 2 -2 2 -1 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
-1 1 -1 1 0 1 0 0
-1 1 -1 1 0 1 0 0
0 2 -2 1 -1 1 0 0
-1 2 -2 1 -2 1 0 0
-1 1 -1 0 0 0 0 0
Qunatized DCT
Coefficients
26
-50-1 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

Fig. 2c

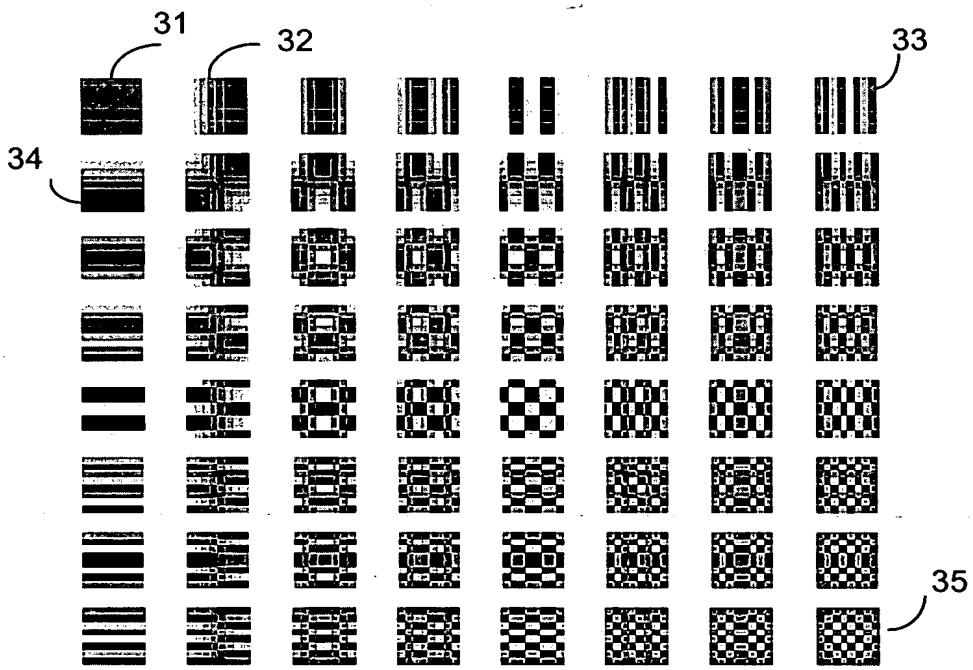
31
32
33
34
35

Fig. 3

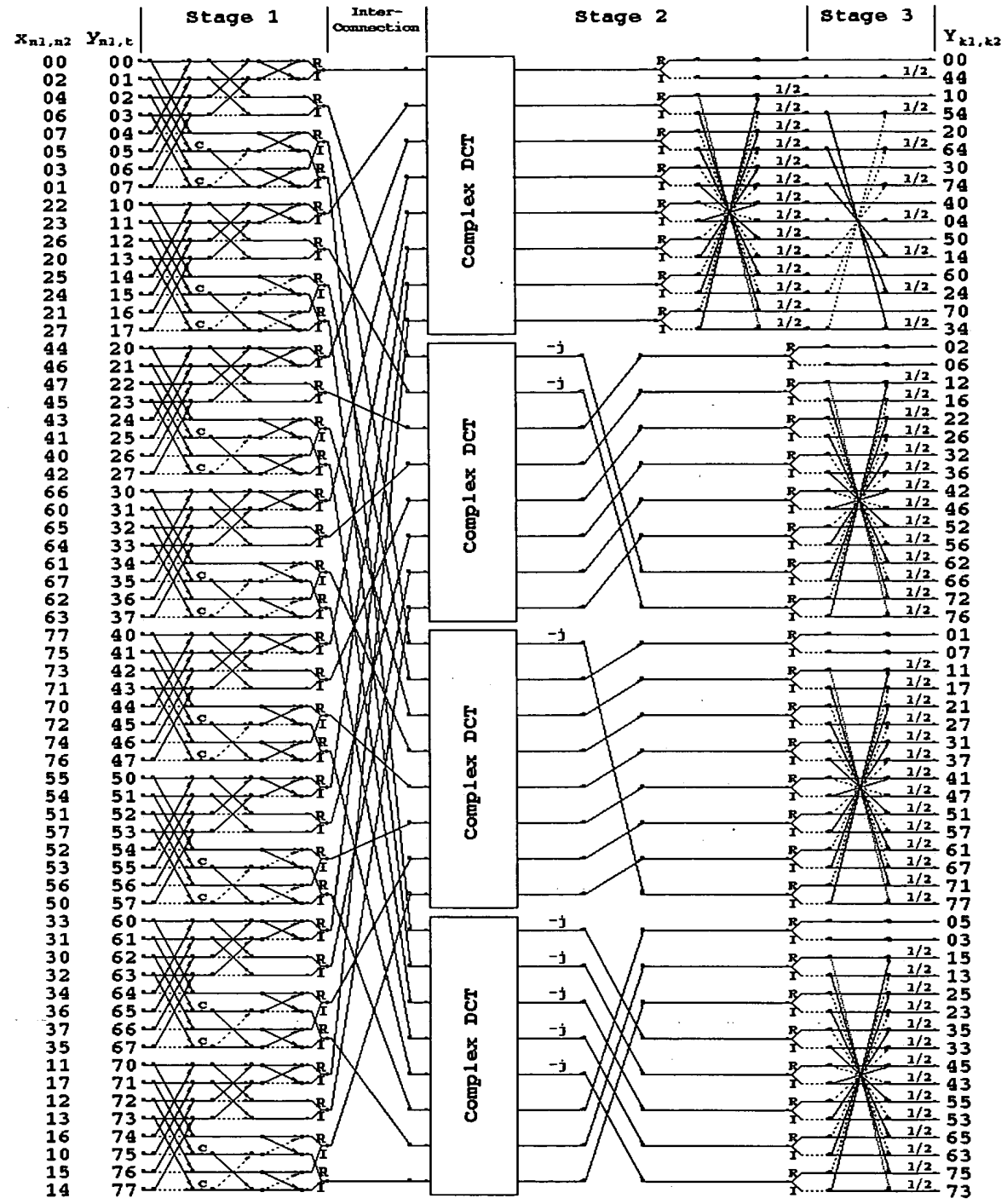
Stage 1
Inter-Connection
Stage 2
Stage 3
$x_{n1,n2}$
$y_{n1,t}$
$Y_{k1,k2}$
Complex DCT
Complex DCT
Complex DCT
Complex DCT
-j
1/2
R
I
C

Fig. 4

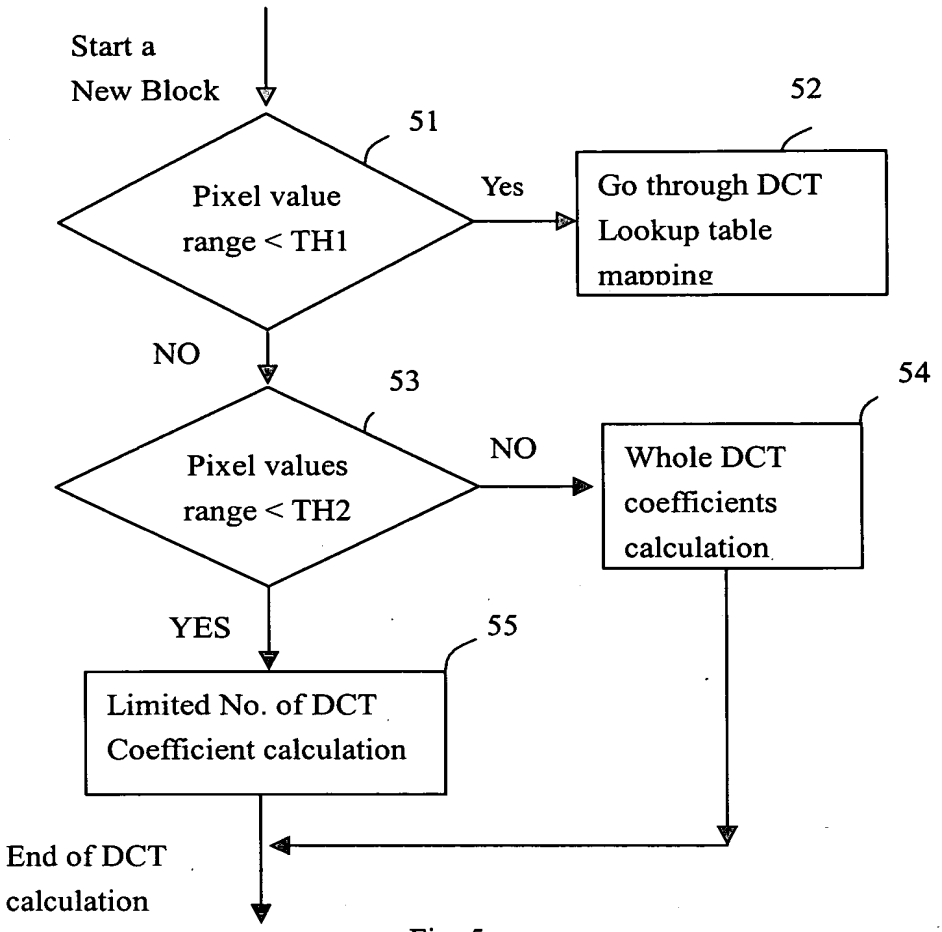
Start a
New Block
51
Pixel value
range < TH1
Yes
52
Go through DCT
Lookup table
mapping
NO
53
Pixel values
range < TH2
NO
54
Whole DCT
coefficients
calculation
YES
55
Limited No. of DCT
Coefficient calculation
End of DCT
calculation

Fig. 5

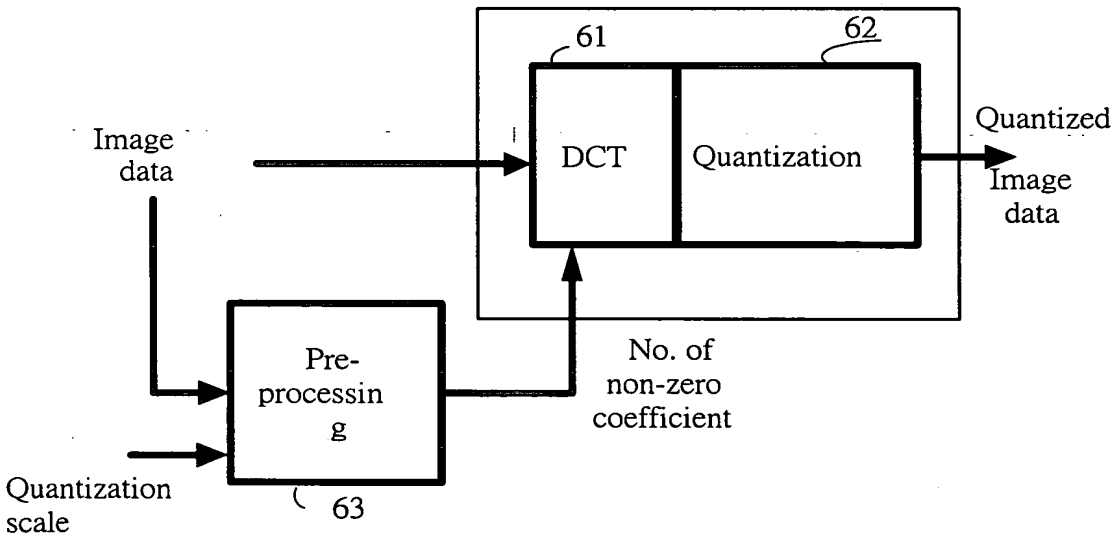
61
62
Image
data
DCT
Quantization
Quantized
Image
data
Pre-
processin
g
No. of
non-zero
coefficient
Quantization
scale
63

Fig. 6

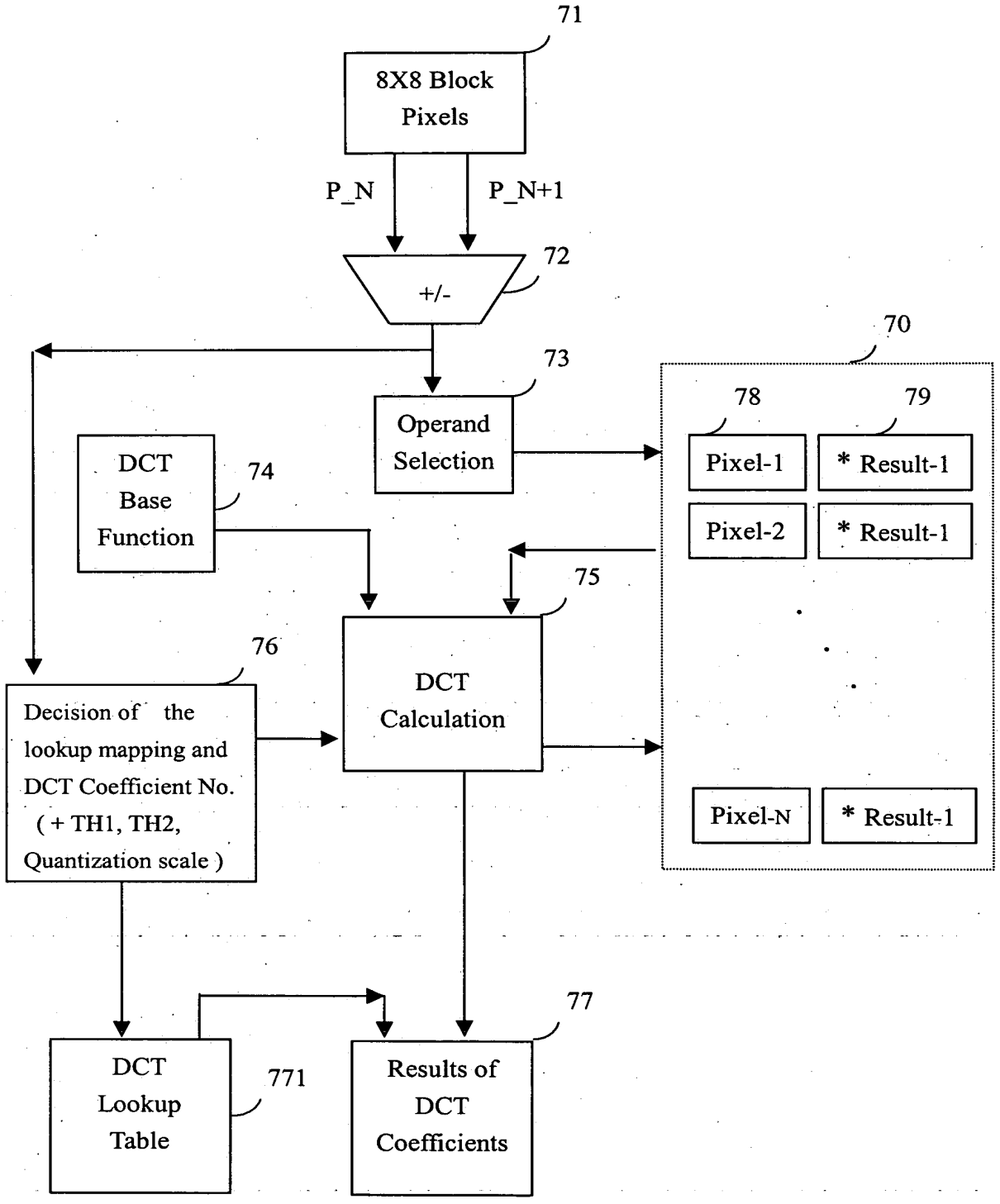
71
8X8 Block Pixels
P_N
P_N+1
72
+/-
70
73
Operand Selection
78
79
Pixel-1
* Result-1
Pixel-2
* Result-1
DCT Base Function
74
75
DCT Calculation
76
Decision of the lookup mapping and DCT Coefficient No. (+ TH1, TH2, Quantization scale)
Pixel-N
* Result-1
77
DCT Lookup Table
771
Results of DCT Coefficients

Fig. 7

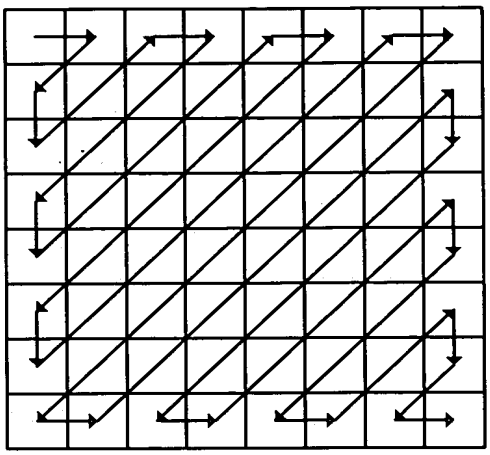

Fig. 8a

→	→	→	↗	0	0	0	0
↙	↗	↗	↗	0	0	0	0
↙	↗	↗	0	0	0	0	0
↙	↗	0	0	0	0	0	0
↙	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Fig. 8b

→	→	↗	0	0	0	0	0
↙	↗	0	0	0	0	0	0
↙	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Fig. 8c

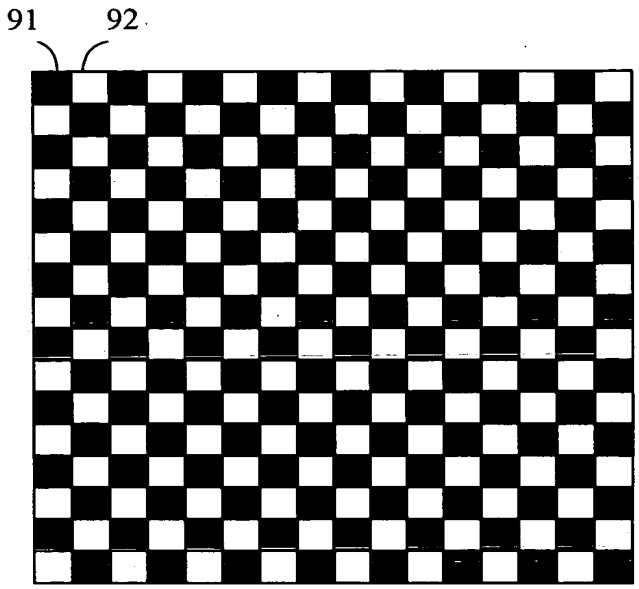

Fig. 9